

User Manual WEB

Charger for Li-Ion Batteries

EN User Manual

Language specific user manuals are available on
www.mascot.no/downloads/usermanuals



Bruksanvisning
Käyttöohjeet
Bedienungsanleitung
Mode d'emploi
Manual de instrucciones
Istruzioni per l'uso



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IMPORTANT SAFETY INSTRUCTIONS!



TO REDUCE THE RISK OF FIRE AND ELECTRIC SHOCK:

READ THROUGH THESE INSTRUCTIONS PRIOR TO USING THE PRODUCT.

CAREFULLY FOLLOW THESE INSTRUCTIONS WHEN USING THE PRODUCT.

RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCE.



CAUTION! DOUBLE POLE / NEUTRAL FUSING!



This product is designed for indoor use.
(Not applicable to products marked "IP67")

IP41 IP44 ☉IP67

A version of this product marked "IP41" may be available. This version is protected against ingress of solid objects larger than 1.0 mm and the effects of vertically falling drops of water according to standard EN/IEC 60529.

A version of this product marked "IP44" may be available. This version is protected against ingress of solid objects larger than 1.0 mm and the effects of water splashed against the enclosure from any direction according to standard EN/IEC 60529.

A version of this product, marked with a symbol with two drops of water and/or "IP67", may be available. This version is filled with a potting compound and is dust-tight and protected against the effects of temporary immersion in water accor-

ding to standard EN/IEC 60529, but must not be immersed in water for longer periods of time.



Products marked with the "double square symbol" are double insulated (Insulation Class II). Products without this mark are Class I (relies on safety earth for protection).

WARNING: To avoid risk of electric shock, Class I products must only be connected to a supply mains with protective earth.



At the end of their service life electric and electronic equipment and their accessories shall not be discarded with the municipal waste but be disposed of using separate collection, treatment, recovery/recycling and environmentally sound disposal. This also applies to any potentially bio hazardous parts and accessories. If in doubt; contact your local authorities to determine the proper method.

Technical specifications for your product:
See tables, the marking on the product or www.mascot.no

Cautions to observe prior to use

- The intended use for this product is to charge a battery or a battery powered electrical accessory (NiCd/NiMH, Lead-Acid, Lithium-Ion or LiFePO₄ batteries) or to be used as a Power Supply to power an electrical accessory. Please see the marking on the product you have to verify the type of product you have and read the applicable instructions and technical specifications included with this manual.
- This product may be used by unskilled operators, under the condition that these instructions are followed.
- Unskilled operators may contact the supplier or manufacturer for assistance, if needed, in setting up, using or maintaining this product and to report unexpected operation or events.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance.
- Do not allow animals to come into contact with this product. Some animals are known to cause damage to cables etc which may be a potential for risk of electric shock and excessive temperatures. Also, cables and small parts may represent a strangulation risk for the animal.
- If the product is equipped with a mains cord, please check that the cord is not damaged. If the cord is damaged, the product must not be used until the cord is replaced. Replacement should be carried out by qualified personnel.
- The mains socket outlet used should always be easily accessible to facilitate immediate removal of the products mains supply should an operational error occur during use. If the product has a detachable mains cord the appliance coupler may be used as a disconnect device.
- The product is “switched on” by inserting the mains plug into the mains socket and “switched off” by disconnecting the mains plug from the mains socket.
- The product may be connected to an IT type mains supply.
- For use in U.S.A.:
 - Be sure to use 125V 15A receptacle configuration before plugging in.
 - Use a UL817-standard compliant mains cord (plug type NEMA 1-15, cord type SJT or SVT).
- For use outside U.S.A:
Use a mains cord compliant with the country specific requirements.
- The time from powering this product until its full function starts may exceed 15 seconds.
- Should an operational error or unexpected change in the performance occur during use; disconnect the product from the mains immediately by disconnecting the mains plug from the mains socket and contact the supplier
- When not in use please think about disconnecting the product from the mains. This will reduce the risk of hazards, reduce the products environmental impact and save electricity costs.
- To avoid overheating make sure there is sufficient room for the circulation of air around the product when in use. Do not cover it up.
- Even though this product complies with relevant safety standards it should not be in contact with human skin for long periods as some people may get allergies or injuries from long-term contact with moderate temperatures and/or plastic materials.
- Prior to using this product with accessories and/or interconnected equipment please carefully read its respective User Manuals.
- If the product is supplied with exchangeable output plugs, please see separate page for assembly.

- Output cables having a modular plug (similar to a telephone connector) must never be connected to a telephone outlet.
- Products with a welded plastic housing are not repairable. Please contact your supplier for replacement part.
- This product contains hazardous voltages and there are no user replaceable parts inside the product. Never attempt to remove the cover.
- **WARNING:** No modification of this equipment is allowed. Any repair/service should be carried out by qualified personnel who may get assistance by contacting the manufacturer or the manufacturer's agent.
- Products specified to have automatic polarity protection must be switched off if a battery is connected with reverse polarity. The protection will be automatically reset when the polarity has been corrected.
- In chargers specified to have a replaceable fuse as polarity protection the fuse must be replaced if the battery has been connected with reverse polarity. When replacing the fuse; a fuse of the same type and rating must be used.
- If the product is specified to comply with the standard for Medical Electrical Equipment (standards based on IEC60601-1) it complies with some of the requirements for medical electrical equipment and may be used in medical applications and hospital environments.
- The product must not be used in the vicinity of flammable anesthetic gases or in other environments with flammable or explosive atmosphere.
- If the product is specified to comply with the standard for Medical Electrical Equipment for Home Healthcare Environment (standard IEC60601-1-11) it may be used in medical applications used in a home healthcare environment.

NOTE: Products relying on safety earth for protection (Class I) may not be used in home healthcare environment unless they are perma-

nently wired to the building installation:
Installation must only be carried out by qualified service personnel, following the below instructions:

- The protective earth conductor must be min. 0.75 mm².
- Connect the protective earth conductor to the external protective earthing system.
- Verify that the protective earth terminal used is connected to the external protective earthing system.
- Verify the integrity of the external protective earthing system.
- This product converts the mains voltage to a safety extra low voltage.
Some products may be treated as Applied Part (Type BF) according to standard EN/IEC 60601-1 and may come in physical contact with a patient.
- This product must be operated in an environment within temperature range +5 to +40°C, humidity 15 - 93 % RH and atmospheric pressure 70 - 106 kPa (700 - 1060 hPa).
- Expected service life of this product and accessories delivered with this product is three (3) years, if operated as indicated above. However; the guarantee times indicated in document "TERMS OF SALES AND DELIVERY FOR MAS-COT AS" apply (available at www.mascot.com).
- Environmental parameters during transport and storage between uses: temperature range -25 to +85 °C, humidity 15 - 93% RH NC and atmospheric pressure 70 - 106 kPa (700 - 1060 hPa).
- If stored for longer periods of time the environmental parameters should be within the temperature range +5 to +35°C, humidity range 10 - 75% RH NC and atmospheric pressure 70 - 106 kPa (700 - 1060 hPa) to maintain the products expected service life.
- Expected shelf life of this product is one (1) year, if stored as indicated above.
- This product complies with the requirements to electromagnetic compatibility for medical electric equipment and for use in residential, office

or light industrial environment but all electric products imply a potential for electromagnetic or other interference between the product and other devices. If such interference is suspected please disconnect the product from the mains and consult a qualified technician, your supplier or the manufacturer.

- No special maintenance procedure is required but if the product gets dusty or dirty it should be wiped clean using a dry cloth while the product is disconnected from the mains. No other maintenance should be necessary.
- For products having a plastic casing, please avoid any contact with lotions, oils, grease and solvents as most types of plastic may be

degraded by such chemicals. Also make sure to position, operate and store such products away from UV-light and direct sunlight.

- Position, operate and store this product only under reasonable foreseeable environmental conditions with respect to magnetic fields, EM-fields, electrostatic discharges, pressure or variations in pressure, acceleration etc.
- If this product is used with or mounted in a vehicle it may only be used when the vehicle is not in use.
- When in use, position this product so that the label can be read – within 40 cm of the operator.

Cautions to observe prior to charging Li-Ion-batteries

- Li-Ion chargers are designed for charging Li-Ion (LI) batteries only. Make sure you have the correct battery charger for the chemistry and number of cells in series. If the number of cells in series in the battery pack is not known you can calculate it by dividing the voltage indicated by 3.6VDC for LI (e.g. a 14.4VDC LI battery contains 4 Li-Ion cells).

Make sure the charge voltage indicated on the charger corresponds to the number of battery cells in series multiplied by 4.2VDC (e.g. a 4 cell LI battery is typically charged using 16.8VDC).

NOTE: The voltages indicated above are typical and may vary between battery types and battery makes. If in doubt; consult the specifications for your battery.

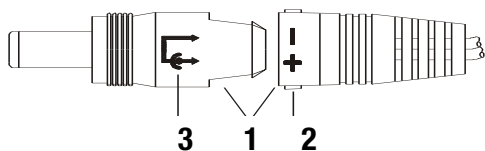
- Make sure the specifications for your battery allows for the maximum charge current indicated on the charger.
- Make sure the specifications for your battery allows for the environmental conditions present during charging.
- Never attempt to charge batteries that are not rechargeable.

- We recommend that you connect the charger to the mains before connection is made to the battery. This will reduce the sparks that may occur due to difference in potential between charger terminals and battery terminals. Note! Make sure the charger terminals are not short-circuited and ensure that the polarity is correct.
- Please ensure correct polarity when connecting to the battery terminals. Reverse polarity connection may, in some chargers (see the chargers specifications), result in a fuse blowing, requiring replacement or leaving the charger useless.
- The charge cycle starts when the charger is connected to the mains.
- If the charger is disconnected from the mains voltage during a charge cycle the charger will start a new charge cycle when it is reconnected to the mains.
- The recommended minimum and maximum battery capacity for which the specific charger can be used vary from battery to battery. Please follow the datasheet and recommendations from the battery manufacturer. In our tables we use typical 1C as a maximum current for Li-Ion cells.

1C means that charge current for a 1Ah battery should be max 1A. Thus the typical minimum capacity recommendation is 1Ah for a 1A charger. For max battery capacity we have used C/40 for chargers with timer (and/or uC) and 100 times current detection levels for chargers

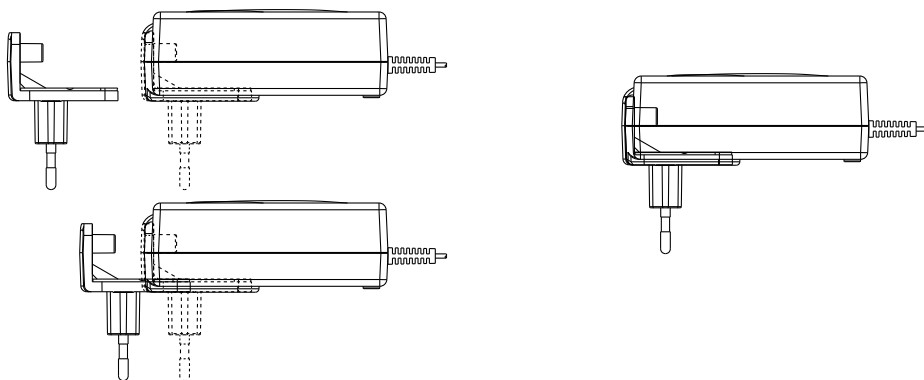
using only this termination method. For a 1A charger with 0.1A current detection level the max capacity recommended will be $100 \times 0.1A = 10Ah$. Again this is just typical recommendations. Please read recommendations and datasheets from battery manufacturer.

How to connect exchangeable DC-output plugs



1. To connect for desired polarity, both plug ends are clearly marked.
2. When connected, the female plug is also marked on each side to identify plug polarity.
3. Shows the center polarity of the plug.

How to connect exchangeable AC-plugs



The following exchangeable AC plugs are available:

Type 018110 - "EURO"	250V 2.5A (EN50075/IEC83 C5 II)
Type 018111 - "US"	125V 2.5A (NEMA 1-15 / CSA-C22.2 No.42)
Type 018112 - "UK"	250V 13A (BS 1363)
Type 018114 - "AUS"	250V 10A (AS/NZS 3112)

Mains Cord Set is available on request if you wish your product to be "DeskTop"

Explanation of Li-Ion battery charge cycle

(See tables for methods for each charger model.)

Charging method A

STEP 1 – CONSTANT CURRENT CHARGE

To start a charge cycle; connect the charger to the mains.

The charger is in constant current mode, charging with the maximum current indicated on the charger, the LED-indication on the charger is ORANGE. This step allows rapid charging of your battery until the battery reaches typically 80 - 95% of its capacity.



STEP 2 – CONSTANT VOLTAGE CHARGE

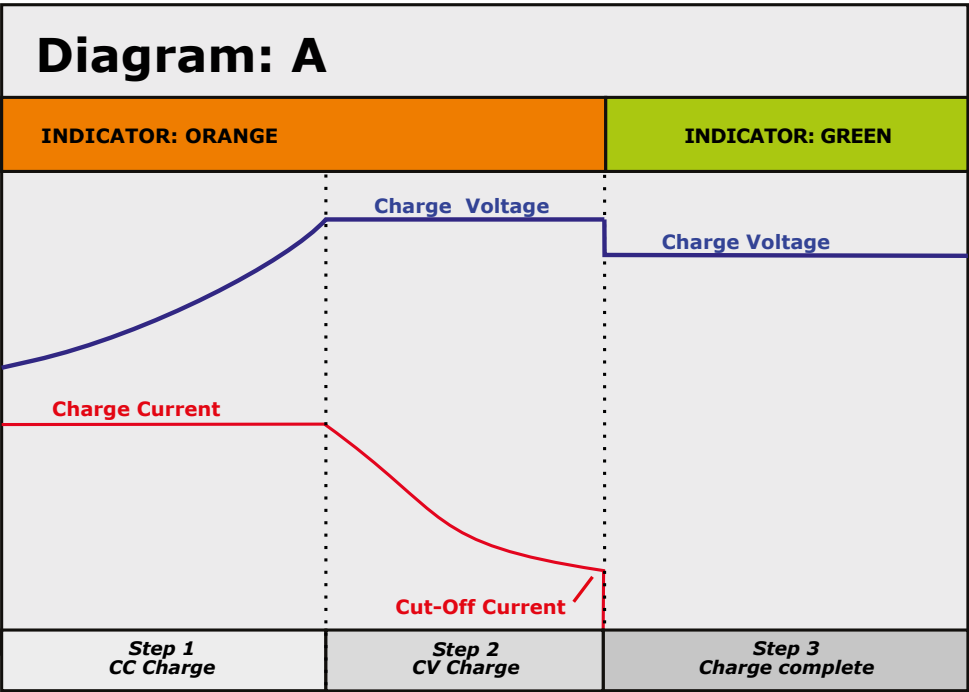
The charger is in constant voltage mode, charging with a decreasing current until the current is below the chargers charge termination level (indicated on the charger). The LED-indication on the charger is ORANGE. The battery is charged to its full capacity at the end of this step



STEP 3 –CHARGE COMPLETE

The LED-indication on the charger is GREEN and the battery is fully charged.

For Li-Ion batteries the charge current is zero and the battery has been charged to its full capacity. After end of charge battery voltage will remain at “Step 2” level even if output voltage of charger is indicated as lower in the diagram. The charger will return to Step 1 if the battery is used. A load larger than the cut-off current will initiate a new charge cycle.



Charging method B

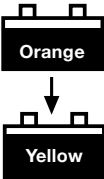
STEP 1 - CONSTANT CURRENT CHARGE

To start a charge cycle; connect the charger to the mains.
The charger is in constant current mode, charging with the maximum current indicated on the charger, the LED-indication on the charger is ORANGE. This step allows rapid charging of your battery until the battery voltage has increased to a certain set level



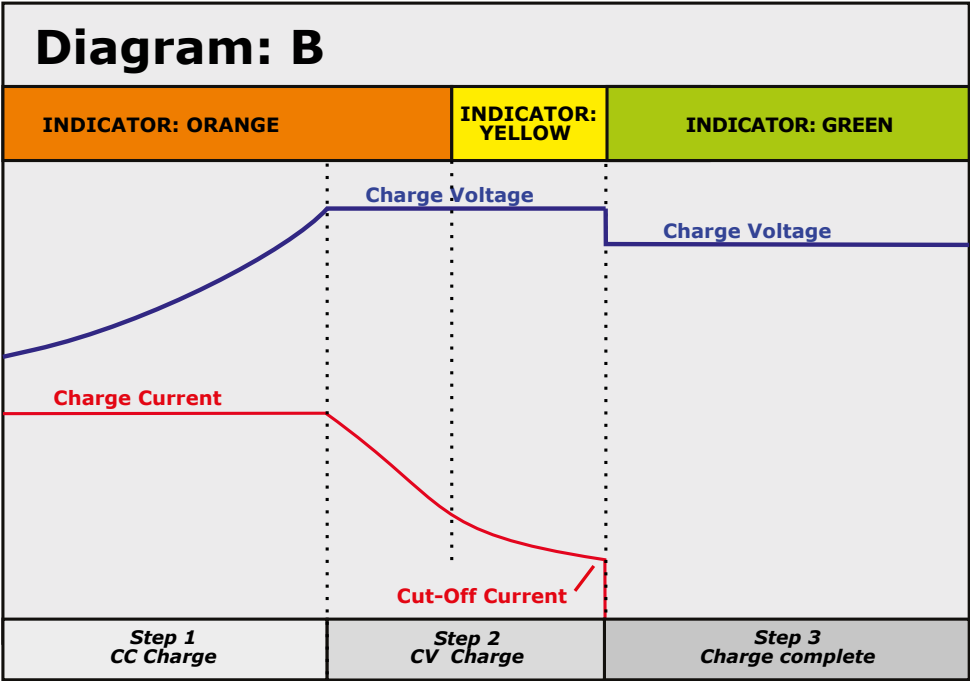
STEP 2 - CONSTANT VOLTAGE CHARGE

When the battery voltage has increased to a certain set level the charger enters constant voltage mode, charging with a decreasing current until the current is below the chargers charge termination level (indicated on the charger). The LED-indication on the charger is ORANGE. When the battery has reached typically 90 - 95% of its full capacity the charge current has dropped below a set level and the LED-indication on the charger changes to YELLOW to indicate that the battery is almost fully charged and may be ready for use. The constant voltage charge continues and the battery reaches its full capacity at the end of this step



STEP 3 - CHARGE COMPLETE

The LED-indication on the charger is GREEN and the battery is fully charged.
For Li-Ion batteries the charge current is zero and the battery has been charged to its full capacity. After end of charge battery voltage will remain at "Step 2" level even if output voltage of charger is indicated as lower in the diagram. The charger will return to Step 1 if the battery is used. A load larger than the cut-off current will initiate a new charge cycle.



Charging method C

STEP 1 – CONSTANT CURRENT CHARGE

To start a charge cycle; connect the charger to the mains.
The charger is in constant current mode, charging with the maximum current indicated on the charger, the LED-indication on the charger is ORANGE (or RED 9640). This step allows rapid charging of your battery until the battery reaches typically 80 - 95% of its capacity.



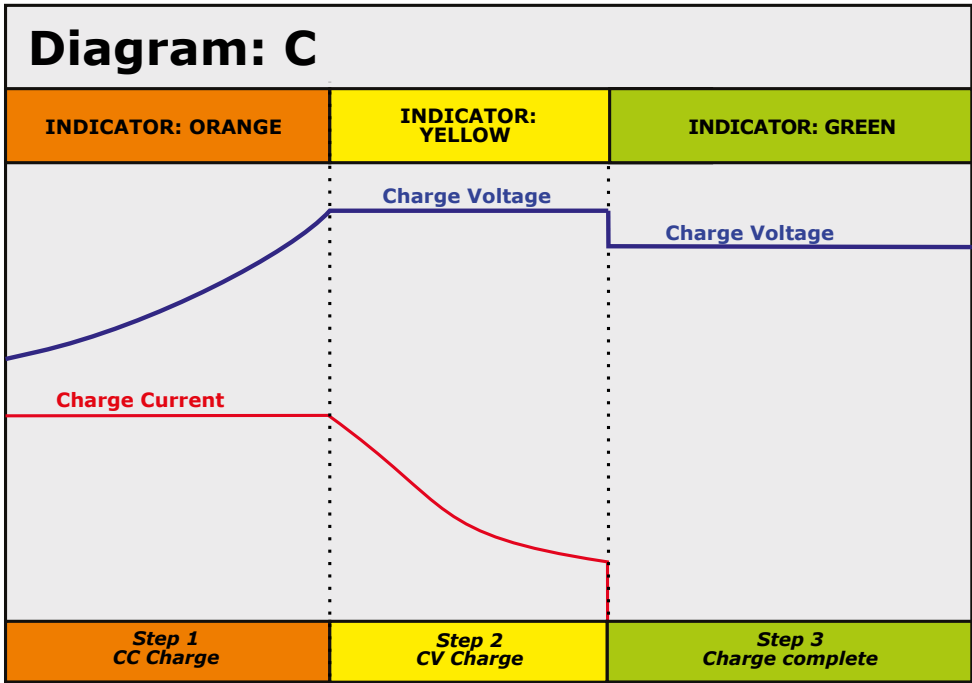
STEP 2 – CONSTANT VOLTAGE (TIMER) CHARGE

The charger is in constant voltage mode, charging with a decreasing current. The LED-indication on the charger is YELLOW. The charger is now in timer mode indicated by the YELLOW LED and will remain in this mode until time interval is completed. The battery is charged to its full capacity at the end of this step.



STEP 3 - CHARGE COMPLETE

The LED-indication on the charger is GREEN and the battery is fully charged.
For Li-Ion batteries the charge current is zero and the battery has been charged to its full capacity.
The charge voltage is at standby level which means that the charger can continue to be connected to the battery. After end of charge battery voltage will remain at “Step 2” level even if output voltage of charger is indicated as lower in the diagram.
The charger will return to Step 1 if the battery is used. A load larger than the constant current level in Step 1 will initiate a new charge cycle.



Technical data (If not appearing in table see marking on the product)

Charge diagram A

	Input voltage	Charge LED indicator	1 cell (3.6V)	2 cell (7.2V)	3 cell (10.8V)	4 cell (14.4V)	5 cell (18V)
2240 2241	100-240Vac 50-60Hz	Orange CC ch.: Orange CV ch.: Green ch. complete: Rec. batt. capacity:	1.3A < 4.2V 4.2V > 100mA < 100mA 1.3Ah – 10Ah	1.3A < 8.4V 8.4V > 100mA < 100mA 1.3Ah – 10Ah	1.2A < 12.6V 12.6V > 100mA < 100mA 1.2Ah – 10Ah	0.9A < 16.8V 16.8V > 100mA < 100mA 0.9Ah – 10Ah	0.7A < 21V 21V > 100mA < 100mA 0.7Ah – 10Ah
2740	100-240Vac 50-60Hz	Orange CC ch.: Orange CV ch.: Green ch. complete: Rec. batt. capacity:	1.0A < 4.2V 4.2V > 100mA < 100mA 1Ah – 10Ah	1.0A < 8.4V 8.4V > 100mA < 100mA 1Ah – 10Ah	0.7A < 12.6V 12.6V > 100mA < 100mA 0.7Ah – 10Ah	0.6A < 16.8V 16.8V > 100mA < 100mA 0.6Ah – 10Ah	0.5A < 21V 21V > 100mA < 100mA 0.7Ah – 10Ah

	Input voltage	Charge LED indicator	6 cell (21.6V)	7 cell (25.2V)	8 cell (28.8V)	9 cell (32.4V)	10 cell (36V)
2240 2241	100-240Vac 50-60Hz	Orange CC ch.: Orange CV ch.: Green ch. complete: Rec. batt. capacity:	0.6A < 25.2V 25.2V > 100mA < 100mA 0.6Ah – 10Ah	0.56A < 29.4V 29.4V > 100mA < 100mA 0.56Ah – 10Ah	0.45A < 33.6V 33.6V > 100mA < 100mA 0.45Ah – 10Ah	0.4A < 37.8V 37.8V > 100mA < 100mA 0.4Ah – 10Ah	0.35A < 42V 42V > 100mA < 100mA 0.35Ah – 10Ah
2740	100-240Vac 50-60Hz	Orange CC ch.: Orange CV ch.: Green ch. complete: Rec. batt. capacity:	0.4A < 25.2V 25.2V > 100mA < 100mA 0.4Ah – 10Ah	0.35A < 29.4V 29.4V > 100mA < 100mA 0.35Ah – 10Ah	0.3A < 33.6V 33.6V > 100mA < 100mA 0.3Ah – 10Ah	0.27A < 37.8V 37.8V > 100mA < 100mA 0.27Ah – 10Ah	0.25A < 42V 42V > 100mA < 100mA 0.25Ah – 10Ah

	Input voltage	Charge LED indicator	11 cell (39.6V)	12 cell (43.2V)	13 cell (46.8V)	14 cell (50.4V)	16 cell (57.6V)
2240 2241	100-240Vac 50-60Hz	Orange CC ch.: Orange CV ch.: Green ch. complete: Rec. batt. capacity:	0.32A < 46.2V 46.2V > 100mA < 100mA 0.3Ah – 10Ah	0.3A < 50.4V 50.4V > 100mA < 100mA 0.3Ah – 10Ah	0.27A < 54.6V 54.6V > 100mA < 100mA 0.3Ah – 10Ah	0.26A < 58.8V 58.8V > 100mA < 100mA 0.3Ah – 10Ah	0.22A < 67.2V 67.2V > 100mA < 100mA 0.2Ah – 10Ah
2740	100-240Vac 50-60Hz	Orange CC ch.: Orange CV ch.: Green ch. complete: Rec. batt. capacity:	0.22A < 46.2V 46.2V > 100mA < 100mA 0.2Ah – 10Ah	0.2A < 50.4V 50.4V > 100mA < 100mA 0.2Ah – 10Ah	0.18A < 54.6V 54.6V > 100mA < 100mA 0.2Ah – 10Ah	0.17A < 58.8V 58.8V > 100mA < 100mA 0.15Ah – 10Ah	0.15A < 67.2V 67.2V > 100mA < 100mA 0.15Ah – 10Ah

Charge diagram B

	Input voltage	Charge LED indicator	1 cell (3.6V)	2 cell (7.2V)	3 cell (10.8V)	4 cell (14.4V)	5 cell (18V)
2541 2542	100-240Vac 50-60Hz (20-60Vdc)	Orange CC ch.:	2.7A < 4.2V	2.2A < 14.7V	2.3A < 12.6V	2.0A < 16.8V	1.6A < 21V
		Orange CV ch.:	4.2V > 1.15A	14.7V > 1A	12.6V > 1.0A	16.8V > 0.85A	21V > 0.7A
2544	10-30Vdc	Yellow CV ch.:	4.2V < 1.15A	14.7V < 1A	12.6V < 1.0A	16.8V < 0.85A	21V < 0.7A
		Green ch. complete:	< 100mA	13.7V < 250mA	< 100mA	< 100mA	< 100mA
		Rec. batt. capacity:	2.7Ah – 10Ah	11Ah – 12.5Ah	2.3Ah – 10Ah	2Ah – 10Ah	1.6Ah – 10Ah
3044	10-30Vdc	Orange CC ch.:	3.0A < 4.2V	2.7A < 8.4V	2.3A < 12.6V	2.0A < 16.8V	1.6A < 21V
		Orange CV ch.:	4.2V > 1.15A	8.4V > 1.15A	12.6V > 0.9A	16.8V > 0.85A	21V > 0.7A
2641 per chan- nel	100-240Vac 50-60Hz	Yellow CV ch.:	4.2V < 1.15A	8.4V < 1.15A	12.6V < 0.9A	16.8V < 0.85A	21V < 0.7A
		Green ch. complete:	< 100mA	< 100mA	< 100mA	< 100mA	< 100mA
		Rec. batt. capacity:	3Ah – 10Ah	2.7Ah – 10Ah	2.3Ah – 10Ah	2Ah – 10Ah	1.6Ah – 10Ah
2440	100-240Vac 50-60Hz	Orange CC ch.:	4.0A < 4.2V	4.0A < 8.4V	4.0A < 12.6V	3.5A < 16.8V	2.8A < 21V
		Orange CV ch.:	4.2V > 2A	8.4V > 2A	12.6V > 2A	12.6V > 1.7A	21V > 1.5A
2840 3240	220-240Vac 50-60Hz	Yellow CV ch.:	4.2V < 2A	8.4V < 2A	12.6V < 2A	12.6V < 1.7A	21V < 1.5A
		Green ch. complete:	< 250mA	< 250mA	< 250mA	< 250mA	< 250mA
		Rec. batt. capacity:	4Ah – 25Ah	4Ah – 25Ah	4Ah – 25Ah	3.5Ah – 25Ah	2.8Ah – 25Ah
3340	220-240Vac	Orange CC ch.:	2.7A < 4.2V	2.7A < 8.4V	2.3A < 12.6V	1.8A < 16.8V	1.4A < 21V
		Orange CV ch.:	4.2V > 1.15A	8.4V > 1.15A	12.6V > 0.9A	16.8V > 0.85A	21V > 0.6A
		Yellow CV ch.:	4.2V < 1.15A	8.4V < 1.15A	12.6V < 0.9A	16.8V < 0.85A	21V < 0.6A
		Green ch. complete:	< 100mA	< 100mA	< 100mA	< 100mA	< 100mA
		Rec. batt. capacity:	2.7Ah – 10Ah	2.7Ah – 10Ah	2.3Ah – 10Ah	1.8Ah – 10Ah	1.4Ah – 10Ah
2840 3240	220-240Vac 50-60Hz	Orange CC ch.:	4.5A < 4.2V	4.5A < 8.4V	4.5A < 12.6V	3.5A < 16.8V	3.3A < 21V
		Orange CV ch.:	4.2V > 1.8A	8.4V > 1.8A	12.6V > 1.8A	16.8V > 1.6A	21V > 1.6A
3340	220-240Vac	Yellow CV ch.:	4.2V < 1.8A	8.4V < 1.8A	12.6V < 1.8A	16.8V < 1.6A	21V < 1.6A
		Green ch. complete:	< 300mA	< 300mA	< 300mA	< 300mA	< 300mA
		Rec. batt. capacity:	4Ah – 30Ah	4Ah – 30Ah	4Ah – 30Ah	3.5Ah – 30Ah	3.3Ah – 30Ah
2840 3240	220-240Vac 50-60Hz	Orange CC ch.:	8.5A < 4.2V	8A < 8.4V	7A < 12.6V	6A < 16.8V	4.5A < 21V
		Orange CV ch.:	4.2V > 3.8A	8.4V > 3.5A	12.6V > 3.1A	16.8V > 2.7A	21V > 1.9A
3340	220-240Vac	Yellow CV ch.:	4.2V < 3.8A	8.4V < 3.5A	12.6V < 3.1A	16.8V < 2.7A	21V < 1.9A
		Green ch. complete:	< 300mA	< 300mA	< 300mA	< 300mA	< 300mA
		Rec. batt. capacity:	8.5Ah – 30Ah	8Ah – 30Ah	7Ah – 30Ah	6Ah – 30Ah	4.5Ah – 30Ah
			N.A.	N.A.	N.A.	N.A.	N.A.

	Input voltage	Charge LED indicator	6 cell (21.6V)	7 cell (25.2V)	8 cell (28.8V)	9 cell (32.4V)	10 cell (36V)
2541 2542	100-240Vac 50-60Hz (20-60Vdc)	Orange CC ch.:	1.4A <25.2V	1.2A <29.4V	1.0A <33.6V	0.9A <37.8V	0.8A <42V
		Orange CV ch.:	25.2V >0.6A	29.4V >0.5A	33.6V >0.4A	37.8V >0.35A	42V >0.35A
2544	10-30Vdc	Yellow CV ch.:	25.2V <0.6A	29.4V <0.5A	33.6V <0.4A	37.8V <0.35A	42V <0.35A
		Green ch. complete:	<100mA	<100mA	<100mA	<100mA	<100mA
3044	10-30Vdc	Rec. batt. capacity:	1.4Ah – 10Ah	1.2Ah – 10Ah	1Ah – 10Ah	0.9Ah – 10Ah	0.8Ah – 10Ah
		Orange CC ch.:	1.4A <25.2V	1.2A <29.4V	1.0A <33.6V	0.9A <37.8V	0.8A <42V
2641 per chan- nel	100-240Vac 50-60Hz	Orange CV ch.:	25.2V >0.6A	29.4V >0.5A	33.6V >0.4A	37.8V >0.35A	42V >0.3A
		Yellow CV ch.:	25.2V <0.6A	29.4V <0.5A	33.6V <0.4A	37.8V <0.35A	42V <0.3A
2440	100-240Vac 50-60Hz	Green ch. complete:	<100mA	<100mA	<100mA	<100mA	<100mA
		Rec. batt. capacity:	1.4Ah – 10Ah	1.0Ah – 10Ah	0.9Ah – 10Ah	0.8Ah – 10Ah	0.7Ah – 10Ah
2840 3240	220-240Vac 50-60Hz	Orange CC ch.:	2.8A <25.2V	2.5A <29.4V	2.1A <33.6V	1.9A <37.8V	1.8A <42V
		Orange CV ch.:	25.2V >1.6A	29.4V >0.8A	33.6V >0.8A	37.8V >0.8A	42V >0.8A
3340	220-240Vac	Yellow CV ch.:	25.2V <1.6A	29.4V <0.8A	33.6V <0.8A	37.8V <0.8A	42V <0.8A
		Green ch. complete:	<300mA	<300mA	<300mA	<200mA	<200mA
3340	220-240Vac	Rec. batt. capacity:	2.8Ah – 30Ah	2.5Ah – 30Ah	2.1Ah – 30Ah	1.9Ah – 20Ah	1.8Ah – 20Ah
		Orange CC ch.:	3.9A <25.2V	3.5A <29.4V	3A <33.6V	2.7A <37.8V	2.4A <42V
3340	220-240Vac	Orange CV ch.:	25.2V >1.7A	29.4V >1.6A	33.6V >1.4A	37.8V >1.3A	42V >1.2A
		Yellow CV ch.:	25.2V <1.7A	29.4V <1.6A	33.6V <1.4A	37.8V <1.3A	42V <1.2A
3340	220-240Vac	Green ch. complete:	<300mA	<300mA	<300mA	<300mA	<300mA
		Rec. batt. capacity:	3.9Ah – 30Ah	3.5Ah – 30Ah	3Ah – 30Ah	2.7Ah – 30Ah	2.4Ah – 30Ah
3340	220-240Vac	Orange CC ch.:	25A <25.2V	22A <29.4V	19A <33.6V	17A <37.8V	15A <42V
		Orange CV ch.:	25.2V >10A	29.4V >7A	33.6V >7A	37.8V >7A	42V >7A
3340	220-240Vac	Yellow CV ch.:	25.2V <10A	29.4V <7A	33.6V <7A	37.8V <7A	42V <7A
		Green ch. complete:	<3A	<3A	<3A	<3A	<3A
3340	220-240Vac	Rec. batt. capacity:	25Ah – 300Ah	22Ah – 300Ah	19Ah – 300Ah	17Ah – 300Ah	15Ah – 300Ah

	Input voltage	Charge LED indicator	11 cell (39.6V)	12 cell (43.2V)	13 cell (46.8V)	14 cell (50.4V)	16 cell (57.6V)
2541 2542	100-240Vac 50-60Hz (20-60Vdc)	Orange CC ch.:	0.7A < 46.2V	0.7A < 50.4V	0.6A < 54.6V	0.6A < 58.8V	0.5A < 67.2V
		Orange CV ch.:	46.2V > 0.3A	50.4V > 0.3A	54.6V > 0.25A	58.8V > 0.25A	67.2V > 0.2A
		Yellow CV ch.:	46.2V < 0.3A	50.4V < 0.3A	54.6V < 0.25A	58.8V < 0.25A	67.2V < 0.2A
		Green ch. complete: Rec. batt. capacity:	< 100mA 0.7Ah – 10Ah	< 100mA 0.7Ah – 10Ah	< 100mA 0.6Ah – 10Ah	< 100mA 0.6Ah – 10Ah	< 100mA 0.5Ah – 10Ah
2544	10-30Vdc	Orange CC ch.:	0.7A < 46.2V	0.7A < 50.4V	0.6A < 54.6V	0.6A < 58.8V	0.5A < 67.2V
		Orange CV ch.:	46.2V > 0.3A	50.4V > 0.3A	54.6V > 0.25A	58.8V > 0.25A	67.2V > 0.2A
		Yellow CV ch.:	46.2V < 0.3A	50.4V < 0.3A	54.6V < 0.25A	58.8V < 0.25A	67.2V < 0.2A
		Green ch. complete: Rec. batt. capacity:	< 100mA 0.7Ah – 10Ah	< 100mA 0.7Ah – 10Ah	< 100mA 0.6Ah – 10Ah	< 100mA 0.6Ah – 10Ah	< 100mA 0.5Ah – 10Ah
3044	10-30Vdc	Orange CC ch.:	1.3A < 46.2V	1.2A < 50.4V	1.1A < 54.6V	1A < 58.8V	0.8A < 67.2V
		Orange CV ch.:	46.2V > 0.6A	50.4V > 0.5A	54.6V > 0.45A	58.8V > 0.4A	67.2V > 0.35A
		Yellow CV ch.:	46.2V < 0.6A	50.4V < 0.5A	54.6V < 0.45A	58.8V < 0.4A	67.2V < 0.35A
		Green ch. complete: Rec. batt. capacity:	< 100mA 1.3Ah – 10Ah	< 100mA 1.2Ah – 10Ah	< 100mA 1.1Ah – 10Ah	< 100mA 1Ah – 10Ah	< 100mA 0.8Ah – 10Ah
2641 per chan- nel	100-240Vac 50-60Hz	Orange CC ch.:	0.6A < 46.2V	0.6A < 50.4V	0.5A < 54.6V	0.5A < 58.8V	0.45A < 67.2V
		Orange CV ch.:	46.2V > 0.25A	50.4V > 0.25A	54.6V > 0.25A	58.8V > 0.25A	67.2V > 0.2A
		Yellow CV ch.:	46.2V < 0.25A	50.4V < 0.25A	54.6V < 0.25A	58.8V < 0.25A	67.2V < 0.2A
		Green ch. complete: Rec. batt. capacity:	< 100mA 0.6Ah – 10Ah	< 100mA 0.6Ah – 10Ah	< 100mA 0.5Ah – 10Ah	< 100mA 0.5Ah – 10Ah	< 100mA 0.45Ah – 10Ah
2440	100-240Vac 50-60Hz	Orange CC ch.:	1.6A < 46.2V	1.45A < 50.4V	1.35A < 54.6V	1.3A < 58.8V	1A < 67.2V
		Orange CV ch.:	46.2V > 0.8A	50.4V > 0.6A	54.6V > 0.6A	58.8V > 0.6A	67.2V > 0.6A
		Yellow CV ch.:	46.2V < 0.8A	50.4V < 0.6A	54.6V < 0.6A	58.8V < 0.6A	67.2V < 0.6A
		Green ch. complete: Rec. batt. capacity:	< 200mA 1.6Ah – 20Ah	< 200mA 1.45Ah – 20Ah	< 100mA 1.35Ah – 10Ah	< 100mA 1.3Ah – 10Ah	< 100mA 1Ah – 10Ah
2840 3240	220-240Vac 50-60Hz	Orange CC ch.:	2.2A < 46.2V	2A < 50.4V	1.8A < 54.6V	1.7A < 58.8V	1.5A < 67.2V
		Orange CV ch.:	46.2V > 0.9A	50.4V > 0.9A	54.6V > 0.8A	58.8V > 0.7A	67.2V > 0.6A
		Yellow CV ch.:	46.2V < 0.9A	50.4V < 0.9A	54.6V < 0.8A	58.8V < 0.7A	67.2V < 0.6A
		Green ch. complete: Rec. batt. capacity:	< 300mA 2.2Ah – 30Ah	< 300mA 2.2Ah – 30Ah	< 300mA 1.8Ah – 30Ah	< 300mA 1.7Ah – 30Ah	< 200mA 1.5Ah – 20Ah
3340	220-240Vac	Orange CC ch.:	14A < 46.2V	13A < 50.4V	12A < 54.6V	11A < 58.8V	10A < 67.2V
		Orange CV ch.:	46.2V > 5A	50.4V < 5A	54.6V < 5A	58.8V > 4A	67.2V > 4A
		Yellow CV ch.:	46.2V < 5A	50.4V < 5A	54.6V < 5A	58.8V < 4A	67.2V < 4A
		Green ch. complete: Rec. batt. capacity:	< 2A 14Ah – 200Ah	< 2A 13Ah – 200Ah	< 2A 12Ah – 200Ah	< 2A 11Ah – 200Ah	< 2A 10Ah – 200Ah

Charge diagram C

	Input voltage	Charge LED indicator	1 cell (3.6V)	2 cell (7.2V)	3 cell (10.8V)	4 cell (14.4V)	5 cell (18V)
9640 9641	220-240Vac 50-60Hz	Red/Orange CC ch.: Yellow Timer CV ch.: Green ch. complete: Rec. batt. capacity:	N.A.	2.7A < 8.4V 8.4V < 2.7A (4h) complete 2.7Ah – 108Ah	2.7A < 12.6V 12.6V < 2.7A (4h) complete 2.7Ah – 108Ah	2.4A < 16.8V 16.8V < 2.4A (4h) complete 2.4Ah – 96Ah	1.5A < 21V 21V < 1.5A (4h) complete 1.5Ah – 60Ah
9940 9941	100-240Vac 50-60Hz	Orange CC ch.: Yellow Timer CV ch.: Green ch. complete: Rec. batt. capacity:	N.A.	N.A.	2.3A < 12.6V 12.6V < 2.3A (4h) complete 2.3Ah – 92Ah	2A < 16.8V 16.8V < 2A (4h) complete 2Ah – 80Ah	1.3A < 21V 21V < 1.3A (4h) complete 1.3Ah – 52Ah
2040 2041 2042 2140	100-240Vac 50-60Hz	Orange CC ch.: Yellow Timer CV ch.: Green ch. complete: Rec. batt. capacity:	N.A.	N.A.	4A < 12.6V 12.6V < 4A (4h) complete 4Ah – 400Ah	3.5A < 16.8V 16.8V < 3.5A (4h) complete 3.5Ah – 140Ah	2A < 21V 21V < 2A (4h) complete 2Ah – 80Ah

	Input voltage	Charge LED indicator	6 cell (21.6V)	7 cell (25.2V)	8 cell (28.8V)	9 cell (32.4V)	10 cell (36V)
9640 9641	220-240Vac 50-60Hz	Red/Orange CC ch.: Yellow Timer CV ch.: Green ch. complete: Rec. batt. capacity:	1.5A < 25.2V 25.2V < 1.5A (4h) complete 1.5Ah – 60Ah	1.5A < 29.4V 29.4V < 1.5A (4h) complete 1.5Ah – 60Ah	1.3A < 33.6V 33.6V < 1.3A (4h) complete 1.3Ah – 52Ah	1.1A < 37.8V 37.8V < 1.1A (4h) complete 1.1Ah – 44Ah	1A < 42V 42V < 1A (4h) complete 1Ah – 40Ah
9940 9941	100-240Vac 50-60Hz	Orange CC ch.: Yellow Timer CV ch.: Green ch. complete: Rec. batt. capacity:	1.3A < 25.2V 25.2V < 1.3A (4h) complete 1.3Ah – 52Ah	1.3A < 29.4V 29.4V < 1.3A (4h) complete 1.3Ah – 52Ah	1A < 33.6V 33.6V < 1A (4h) complete 1Ah – 40Ah	0.9A < 37.8V 37.8V < 0.9A (4h) complete 0.9Ah – 36Ah	0.9A < 42V 42V < 0.9A (4h) complete 0.9Ah – 36Ah
2040 2041 2042 2140	100-240Vac 50-60Hz	Orange CC ch.: Yellow Timer CV ch.: Green ch. complete: Rec. batt. capacity:	2A < 25.2V 25.2V < 2A (4h) complete 2Ah – 80Ah	2A < 29.4V 29.4V < 2A (4h) complete 2Ah – 80Ah	1.7A < 33.6V 33.6V < 1.7A (4h) complete 1.7Ah – 68Ah	1.5A < 37.8V 37.8V < 1.5A (4h) complete 1.5Ah – 60Ah	1.4A < 42V 42V < 1.4A (4h) complete 1.4Ah – 56Ah

	Input voltage	Charge LED indicator	11 cell (39.6V)	12 cell (43.2V)	13 cell (46.8V)	14 cell (50.4V)	16 cell (57.6V)
9640 9641	220-240Vac 50-60Hz	Red/Orange CC ch.: Yellow Timer CV ch.: Green ch. complete: Rec. batt. capacity:	N.A.	N.A.	N.A.	N.A.	N.A.
9940 9941	100-240Vac 50-60Hz	Orange CC ch.: Yellow Timer CV ch.: Green ch. complete: Rec. batt. capacity:	N.A.	N.A.	N.A.	N.A.	N.A.
2040 2041 2042 2140	100-240Vac 50-60Hz	Orange CC ch.: Yellow Timer CV ch.: Green ch. complete: Rec. batt. capacity:	1.3A < 46.2V 46.2V < 1.3A (4h) complete 1.3Ah – 52Ah	1.2A < 50.4V 50.4V < 2A (4h) complete 1.2Ah – 48Ah	1.1A < 54.6V 54.6V < 1.1A (4h) complete 1.1Ah – 44Ah	1A < 58.8V 58.8V < 1A (4h) complete 1Ah – 40Ah	N.A.